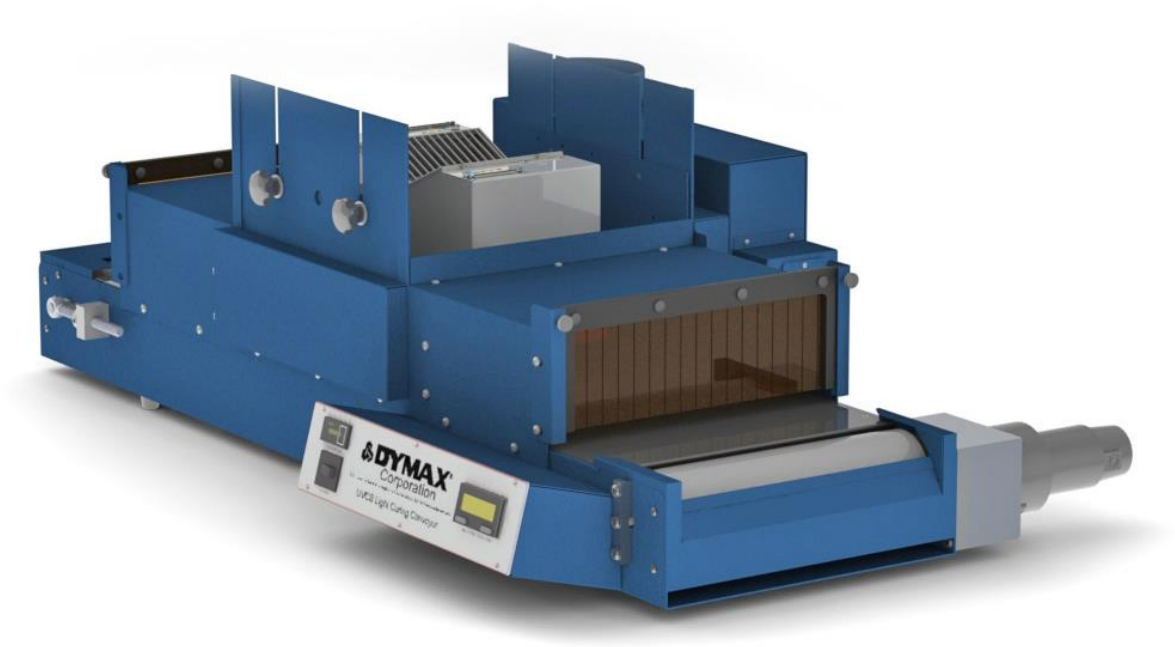
UVCS LED Light-Curing Conveyor Systems User Guide

UVCS Conveyors Outfitted with BlueWave® LED Flood Arrays

- Instructions for Safe Use
- Setup and Operation
- Maintenance
- Ordering Spare Parts and Accessories



DYMAX®

About Dymax

UV/Visible light-curable adhesives. Systems for light curing, fluid dispensing, and fluid packaging.

Dymax manufactures industrial adhesives, light-curable adhesives, epoxy resins, cyanoacrylates, and activator-cured adhesives. We also manufacture a complete line of manual fluid dispensing systems, automatic fluid dispensing systems, and light-curing systems. Light-curing systems include LED light sources, spot, flood, and conveyor systems designed for compatibility and high performance with Dymax adhesives.

Dymax adhesives and light-curing systems optimize the speed of automated assembly, allow for 100% in-line inspection, and increase throughput. System designs enable stand-alone configuration or integration into your existing assembly line.

Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application and use is strictly limited to that contained in the Dymax standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to insure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation by offering equipment trial rental and leasing programs to assist in such testing and evaluations. Data sheets are available for valve controllers or pressure pots upon request.

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Introduction

Introduction to the User Guide

This guide describes how to assemble, use, and maintain Dymax UVCS LED light-curing conveyor systems safely and efficiently.

Intended Audience

Dymax prepared this user guide for experienced process engineers, technicians, and manufacturing personnel. If you are new to UV light sources and do not understand the instructions, contact Dymax Application Engineering to answer your questions before using the equipment.

Where to Get Help

Dymax Customer Support and Application Engineering teams are available in the United States, Monday through Friday, from 8:00 a.m. to 5:30 p.m. Eastern Standard Time. You can also email Dymax at info@dymax.com. Contact information for additional Dymax locations can be found on the back cover of this user guide.

Additional resources are available to ensure a trouble-free experience with our products:

- Detailed product information on www.dymax.com
- Dymax adhesive Product Data Sheets (PDS) on our website
- Material Safety Data Sheets (MSDS) provided with shipments of Dymax adhesives

Safety

WARNING! *If you use a Dymax LED light-curing conveyor system without first reading and understanding the information in this user guide, injury can result from exposure to UV light. To reduce the risk of injury, read and ensure you understand the information in this user guide before assembling and operating the system.*

General Safety Considerations

All users of Dymax UVCS LED light-curing conveyor systems should read and understand this user guide before assembling and using the system.

To learn about the safe handling and use of light-curable formulations, obtain and read the MSDS for each product. Dymax includes an MSDS with each adhesive sold. In addition, fluid product MSDS can be requested on the Dymax website.

CAUTION! *Always wear protective goggles or face shield when working near UV light.* ***Never look directly at light!***

WARNING! *Always observe safety requirements! Do not open the cover of the LED Array or Power Supply. There are no user serviceable parts inside.*

Specific Safety Considerations

Dymax UVCS LED light-curing conveyor systems are designed to maximize operator safety and minimize exposure to light-curing energy. To use the unit safely, it must be set up and operated in accordance with the instructions in this user guide. Please also read and understand the safety considerations unique to light-curing systems as described below.

Safety Symbol Index

The following symbols are displayed on the curing system. Please see below for their meanings.

Refer to Manual

Eye Protection Required

Warning!

Warning! UV Light Hazard

Electrostatic Sensitive Device

WARNING! *Looking directly at the UV light emitted by an LED flood array can result in eye injury. To prevent eye injury, never look directly at the high-intensity light and always wear protective goggles (provided).*

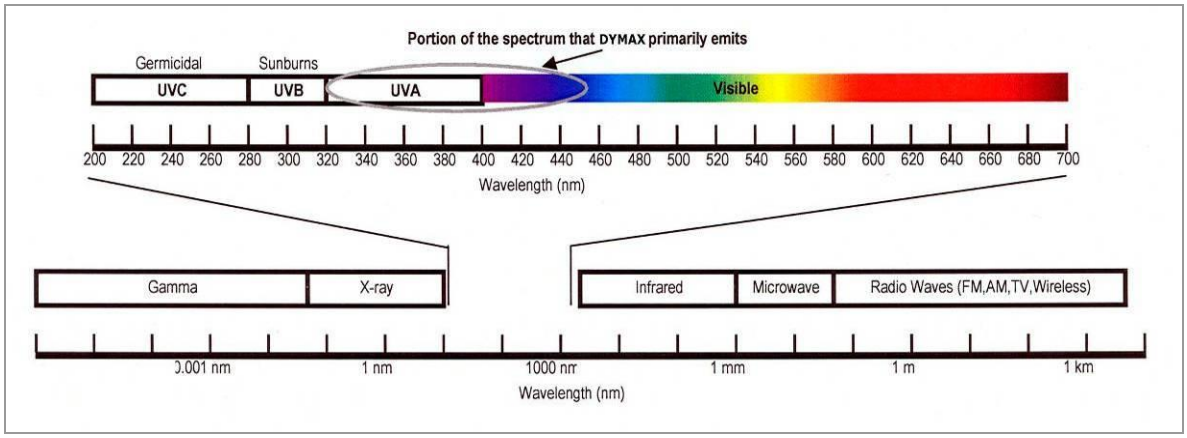
Dymax Light-Curing System Safety Considerations

Operators must understand these three concepts to use the LED light source safely: light exposure, high-temperature surfaces, and bright, visible light. Each is described below.

Light Exposure

The *BlueWave LED Flood's* PrimeCure™ and RediCure™ models emit energy in the UVA portion of the spectrum while the VisiCure™ model emits energy in the visible portion of the spectrum. UVA light is generally considered the safest of the three UV ranges: UVA, UVB, and UVC. Although OSHA does not currently regulate visible or ultraviolet-light exposure in the workplace, the American Conference of Governmental Industrial Hygienists (ACGIH) does recommend Threshold Limit Values (TLV's) for ultraviolet light.

Figure 1. Light Spectrum



The strictest interpretation of the TLV (over the UVA range) for workers' eyes and skin is 1 mW/cm^2 (intensity), continuous exposure. Unless workers are placing bare hands into the curing area, it is unusual to exceed these limits. To put 1 mW/cm^2 limit into perspective, cloudless summer days in Connecticut regularly exceed 3 mW/cm^2 of UVA light and also include the more dangerous UVB light (primarily responsible for suntans, sun burns, and skin cancer) as well.

Checking the Workstation

The human eye cannot detect "pure" UV light, only visible light. A radiometer should be used to measure stray UV light to confirm the safety of a UV light-curing process. A workstation that exposes an operator to more than 1 mW/cm^2 of UVA continuously should be redesigned.

Protecting Operators

Light-curing technology can be a regulatory compliant, "worker-friendly" manufacturing process when the proper safety equipment and operator training is utilized. There are two ways to protect operators from UV exposure: shield the operator and/or shield the source.

Shield the Operator

UV-Blocking Eye Protection - UV-blocking eye protection is recommended when operating UV light-curing systems. Both clear and tinted UV-blocking eye protection is available from Dymax.

UV-Blocking Skin Protection

Where the potential exists for UV exposure upon skin, opaque, UV-blocking clothing, gloves, and full-face shields are recommended.

Shield the Source of UV

Any substrate that blocks UV light can be used as a shield to protect workers from stray UV light. The following materials can be used to create simple shielding structures:

Rigid Plastic Film — Transparent or translucent/UV-blocking plastics (typically polycarbonate or acrylic) are commonly used to create shielding where some level of transparency is also desired.

Flexible Film — Translucent UV-blocking, flexible urethane films can be used to quickly create workstation shielding. This UV-blocking, flexible urethane film is available from Dymax, call for assistance.

High-Temperature Surfaces

Surfaces exposed to high-intensity curing lights will rise in temperature. The intensity, distance, exposure time, cooling fans, and the type/color of the surface can all affect the actual surface temperature. In some cases, exposed surfaces can reach temperatures capable of producing a burn or causing damage to a substrate. In these cases, care must be taken to ensure either a more moderate surface temperature or appropriate protection/training for operators. No infrared radiation is produced by these LED systems, so surface temperatures will be lower than with conventional lamp systems. Empirical testing should be used to verify the exact temperature rise in each application.

Bright, Visible Light

The bright, visible light energy emitted by curing systems can cause eyestrain if proper eye protection or shielding is not used. The proper use of tinted eye protection and/or opaque/tinted shielding can be utilized to reduce eyestrain and address this concern.

Summary

UV-light sources can be more “worker friendly” than many commonly accepted industrial processes, provided the potential concerns are addressed. Both the lower working temperature and lack of spurious frequency transmission that this system produces make it even more user friendly. Contact your Dymax representative for information regarding the proper use of Dymax light-curing systems.

Product Overview

Description of UVCS LED Light-Curing Conveyors

Dymax UVCS LED light-curing conveyor systems use high-intensity light sources for fast curing of light-curable materials. UVCS bench-top conveyors can be outfitted with one of three different wavelength BlueWave® LED flood systems (365 nm, 385 nm, or 405 nm). The flood system consists of two main components: an LED flood array and a power supply that contains the user interface. Only one LED flood array can be connected to a power supply at a time via the interconnect cable. The power supply is designed to be interchangeable and can be used with any of the three different wavelength LED flood arrays.

BlueWave LED flood systems feature an intensity adjustment, allowing the output intensity level to be adjusted from 5 to 100% to meet process and adhesive requirements. LED technology within the *BlueWave LED Flood System* allows for instant on/off activation without the need for a warm-up period, but is also rated for continuous operation. A switch on the conveyor is provided to keep the LED array always active.

Fans in the LED flood power supply and array provide cooling and must not be covered or blocked. Fan Filters must be maintained regularly to ensure reliable operation. Thermal sensors in the LED flood power supply and array shut the unit down to protect the components if the internal temperature exceeds maximum limits. Please refer to the *BlueWave LED Flood System User Guide* for further description and explanation.

WARNING! *If you block the air flow from the LED flood array or the power supply vents, equipment damage and malfunction can result. To prevent damage and malfunction, ensure 1" [2.54 cm] of clearance is provided around the power supply and at least 6" [15.24 cm] of clearance is provided around the cooling fan inlets to allow the free flow of air.*

All UVCS conveyors have adjustable belt speeds and lamp-to-belt distance to address a variety of application requirements. Standard height clearance is 4 inches; optional risers increase clearance to either 6 or 10 inches. When combined, the UVCS conveyors' consistent intensity, fast curing, and adjustable line speeds create an optimized light-curing process that enables high throughput.

Features & Benefits

Features	
Complete UV shielding	Built-in exhaust fan and stack
Controlled and consistent cure times	Integral vacuum hold-down and cooling system
Accepts parts up to 12" x 36"	Accurate digital belt control and readout
4", 6", or 10" vertical clearance available	Adjustable array-to-belt distance
12" belt width (guides available to channel parts into center 6")	Bench-top conveyor (with optional transportation carrying cart)

Assembly and Setup

Unpacking and Inspecting Your Shipment

Your UVCS LED light-curing conveyor will arrive in one or two crates. Inspect the crates and boxes for damage and notify the shipper of box damage immediately.

Open each box and check for equipment damage. If parts are damaged, notify the shipper and submit a claim for the damaged parts. Contact Dymax so that new parts can be shipped to you immediately.

Check that the parts included in your order match those listed below. If parts are missing, contact your local Dymax representative or Dymax Customer Support to resolve the problem.

Parts Included

- *BlueWave LED Flood System*(s) - LED Array, Power Supply, Power Cord, Interconnect Cable
- UVCS Conveyor
- Adapter Plate and Cradle Assembly
- UVCS LED Light-Curing Conveyor Systems User Guide
- UV Protection Goggles

Conveyor System Setup

Conveyor Setup

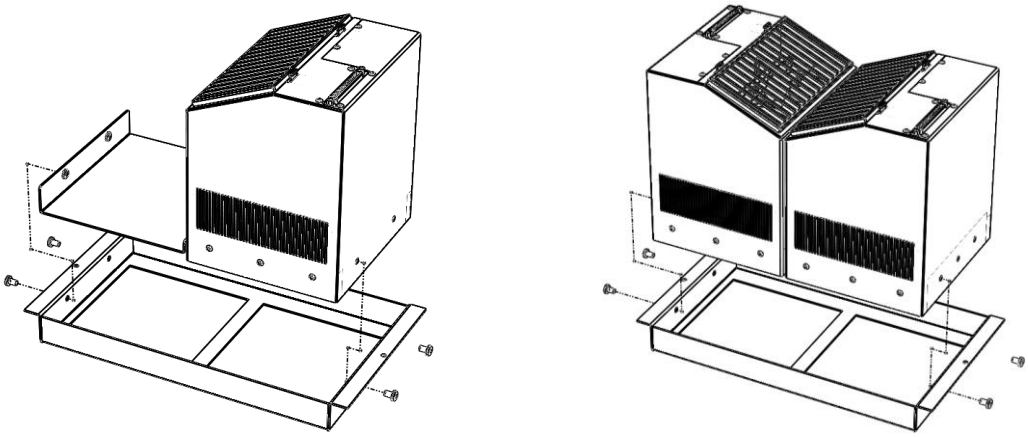
1. If purchased, uncrate and assemble the optional Conveyor Mounting Cart prior to unpacking the Conveyor.
2. Remove the protective coverings from the Conveyor. Place the Conveyor on the Conveyor Mounting Cart or on a convenient work surface. Install the Exhaust Ventilation Stack on the Blower Motor's Outlet Flange. Secure the Exhaust Ventilation Stack with the 3 fasteners provided.
3. Unpack the LED flood System(s). Each Flood System includes an LED array, a power supply, a power cord, and interconnect cables. There may be one or two LED Array systems inside the crate depending on the conveyor system ordered.

Figure 2. Exhaust Ventilation Stack

Mounting the LED Flood Array(s)

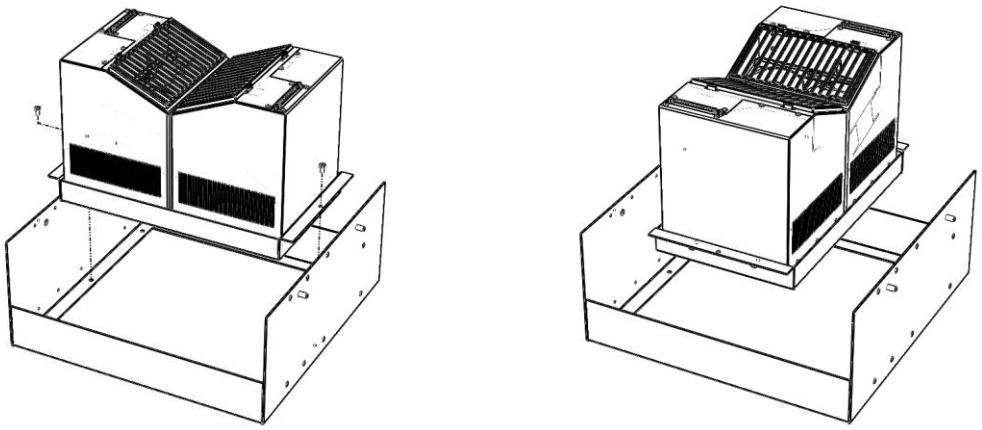
1. Mount the LED Head(s) into the Cradle Adapter Plate using (2) M5 x 8-mm screws (Figure 3).
   a. For a single head assembly, install the Filler Plate to the other side of the Cradle Adapter.
   b. For a dual head configuration, install the two heads face-to-face (with the logos facing each other).

Figure 3. Single & Dual Head Configurations



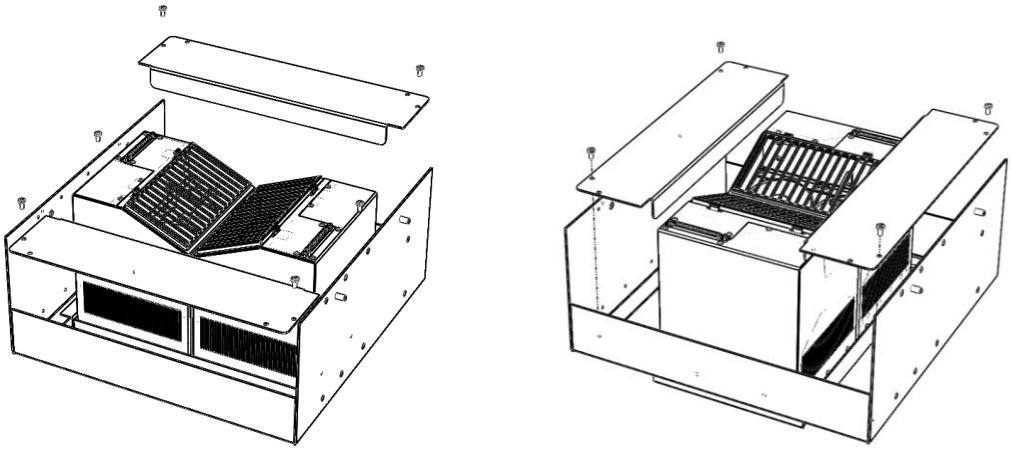
2. Place assembled LED Flood Array(s) and Cradle Adapter Plate onto the Conveyor Housing. The Cradle Adapter can be placed in two different orientations, in-line or side-by-side, onto the Conveyor Cradle as required by your application need.

Figure 4. Cradle Adapter Orientation



3. Take the Two Side Plates and insert one on each side of the Cradle Adapter Plate. The Side Plate bend will fit over and into the Adapter Plate. Secure both Side Plates with M4 x 8-mm screws (4). (Figure 5)

Figure 5. Side Plate Installation

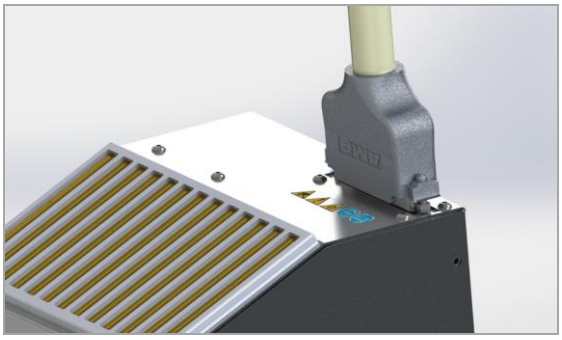


Interconnect Cables

Attach and fasten the 37-Pin Interconnect Cable from the back panel of the Power Supply to the top of the LED Flood Array.

Figure 6. Interconnect Cable to Power Supply

Figure 7. Interconnect Cable to LED Flood Array



The LED Arrays may be controlled using the Activation Switch on the front face of the Conveyor to toggle the LED Array on and off. This allows the LED to remain on for as long as needed. Connect the Footswitch Interconnect Cable (one provided with each LED Array) from the LED Array Controller to one of the Foot Switch Interconnect Jacks in the rear of the Conveyor.

Figure 8. Activation Switch

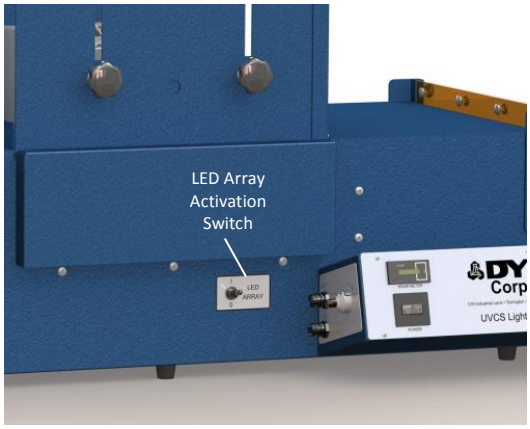
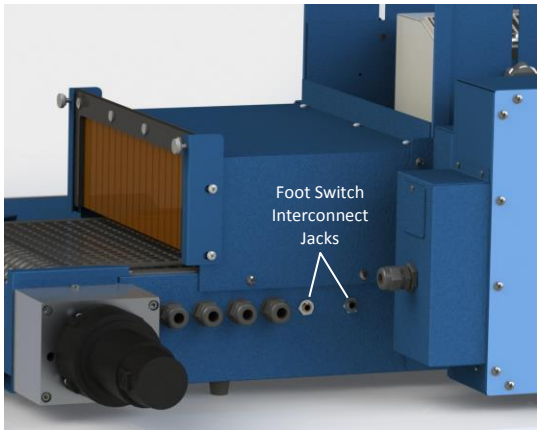


Figure 9. Foot Switch Interconnect Jacks



Operating the Conveyor

The Conveyor and the LED Power Supply(s) each have a Power Cable that needs to be plugged into the wall outlet. The LED Power Supply(s) has a Power Switch located in the back of the unit. The Conveyor also has a Power Switch, located on the front panel. Plug in all the Power Cords and turn the Conveyor on.

Conveyor belt speeds can be adjusted by turning the Speed Control Knob, located on the side of the Conveyor Control Panel. Belt speed is indicated on the Speed Display Indicator. The Belt Speed Knob is a ten-turn potentiometer and is equipped with a lock.

Figure 10. Conveyor Control Panel

The Blower controls the amount of air flowing through the inside chamber of the Conveyor. A small percentage of the air is also diverted downward through the Conveyor Belt. This air flow provides a small hold-down force to keep light objects from moving while traveling on the Belt. The speed of the Exhaust Blower is set at the factory during final system testing for the conveyor model ordered. If the speed of the Exhaust Blower requires adjustment, remove the Access Panel from the front of the Exhaust Blower Housing, unlock the Blower Speed Control Potentiometer, and adjust the speed setting. Relock the Blower Speed Control Potentiometer. The range of the Blower Speed Control Potentiometer is 0.0 to 0.85 turns.

Figure 11. Remove Access Panel

Figure 12. Blower Speed Control

The height of the LED Array can be adjusted using the knobs located on both sides of the Conveyor Cradle. The height indicator can be used as a reference to adjust both sides to the same height. The height indicator does not reflect the actual height of the LED Arrays.

Figure 13. LED Array Height Adjustment

Operating the LED Light

Operating Modes

There are three basic operating modes: Manual Mode, Timer Mode, and PLC Mode. PLC and timer mode are not recommended for use with a conveyor.

Manual Mode: Manual mode allows the user to activate the LED Array with the use of the run button on the front panel or with a signal provided to the footswitch port in the back of the controller. The LED remains active only as long as the run button is pressed. When the run button is released, the LED shuts off. A cable to connect the power supply to the conveyor is provided with each LED Array system. This will allow the user to turn on and off the Array using the front controls on the conveyor. Manual mode is recommended for use with a conveyor.

Timer Mode: The LED is active for a specific time period each time the run button is pressed. Users set the specific time by adjusting the timer's value on the screen. Momentarily pressing the run button starts the timer and activates the LED. When the timer counts down to zero, the LED Array deactivates. The timer resets the countdown and is ready for another exposure cycle. The activation can be cancelled at any time during the exposure cycle by pressing the run button.

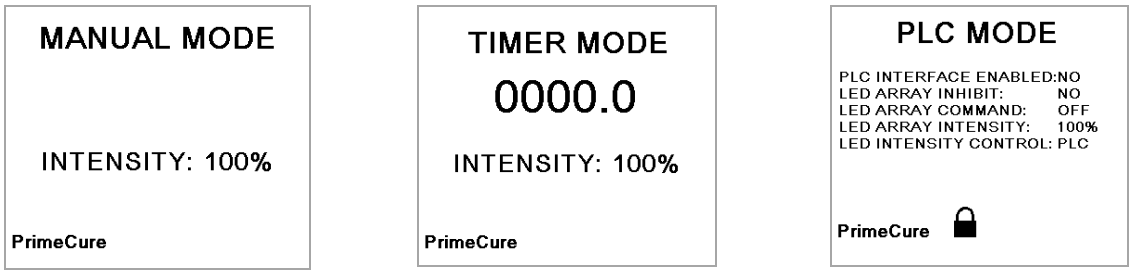
PLC Mode: An external PLC (Programmable Logic Controller) controls the unit. The PLC provides input signals to the *BlueWave LED Flood* to control the LED. The PLC monitors the status of the unit by reading output signals provided by the *BlueWave LED Flood*. The PLC is typically programmed to start other machinery when the unit becomes ready, or perhaps start the unit when other machinery is ready. The input signals and output signals are present through the 25-pin connector on the power supply's back panel marked PLC.

Please consult the User manual for the *BlueWave LED Flood System* for further details about each operation mode.

Choosing an Operating Mode

NOTE: *Upon power-up, your BlueWave LED Flood System will default to its last configuration settings.*

Figure 14. Mode Start-up Screens (Left to Right: Manual Mode, Timer Mode, PLC Mode)



NOTE: *If the BlueWave LED Flood System powers up in PLC Mode, you cannot change any settings via the front panel controls until you press the PLC Access Switch on the back panel.*

To Switch Between Manual and Timer Mode:

1. From the main page, press the SET button to open the Options Menu (Figure 15).
2. Use the ▲ and ▼ buttons, so that the "SELECT MODE" option is flashing and press the SET button to open the Select Mode Menu (Figure 16).
3. Using the ▲ and ▼ buttons, highlight the desired mode and press the SET button.
4. The mode has now been set and the screen should return to the main page.

Figure 15. Options Menu

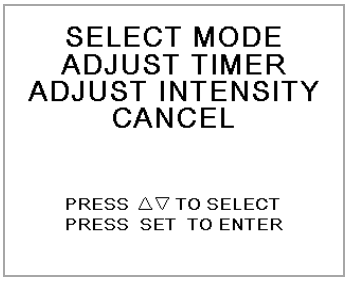
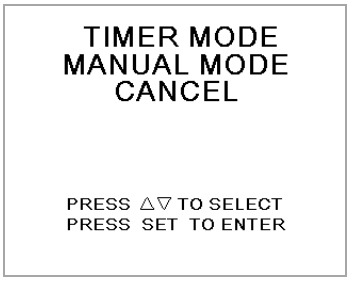


Figure 16. Select Mode Menu



Adjusting Intensity

The output intensity can be adjusted from 10% (depending on the LED Flood configuration ordered) to 100% in 1% increments. To adjust the intensity:

1. From the main screen, press the SET button on the front control panel to enter the Options Menu (Figure 17).
2. Use the ▲ and the ▼ so that the "Adjust Intensity" option is flashing and press the SET button to enter the Adjust Intensity Menu (Figure 18).
3. Use the ▲, ▼, ◀, or ▶ keys to adjust the intensity setting. Press the Set button to enter the value and exit to the main page.

   NOTE: *If you enter intensity that is too low for the LED Flood Array attached the unit, the unit will beep for 5 seconds, and the intensity will not change.*

   If you are operating in PLC mode, a PLC input signal allows intensity to be selected from this menu or allows intensity to be controlled directly by the PLC.

Figure 17. Options Menu

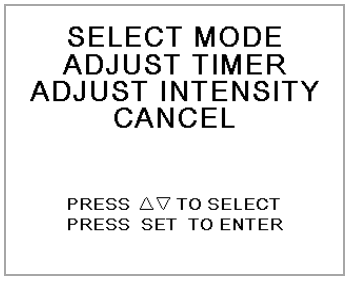
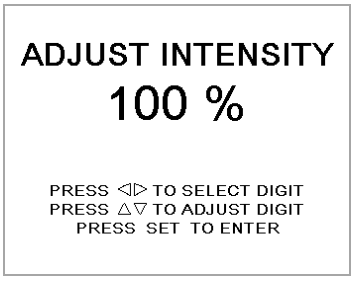


Figure 18. Adjust Intensity Menu



LED Operation

It is recommended that the LED Controller be set to Manual Mode for conveyor operation. Connect the LED Array to the Controller. Connect the Controller to the Conveyor via the Foot Switch Interconnect Cable. Activate the LED Array using the LED Activation Switch on the front of the Conveyor. If the Controller is set to Timer Mode, the LED Activation Switch will toggle the LED Array to turn on and it will turn off after the timer runs down. The LED Array will not activate again until the Activation Switch is toggled off and back on.

Validation

Tests should be conducted prior to production to determine the time and light intensity required to fully cure your resin. The following approaches may be used to validate the curing process.

Set Exposure Time, Determine Intensity

Users can specify an exposure time and, through empirical testing, determine the intensity required and duration of exposure to achieve a full cure. Intensity can be adjusted using the front control screen on the LED Power Supply. Duration of exposure can be adjusted by adjusting the conveyor belt speed. As with any manufacturing process, it is advisable to incorporate a safety factor.

Control

Process validation confirms a minimum acceptable intensity. Users can then choose to operate at full intensity (using the excess intensity as an additional safety factor) or adjust the output to a specific intensity level. To ensure consistent and repeatable process results, intensity levels should be monitored with a radiometer. This enables users to identify changes in light intensity and take corrective action: either adjusting the light intensity or performing maintenance.

Cleaning and Maintenance

Inspect and Replace Fuses

The LED Flood Power Supply has two Fuse Holders located on the rear panel (Figure 19). Follow these steps to inspect and replace the fuses if indicated as a corrective action based on troubleshooting:

1. Unplug the unit.
2. Remove the Fuse Holders using a screwdriver (Figure 20).
3. Remove and inspect the fuses (Figure 21). Replace blown fuses with new ones as specified in the Specifications section.
4. Place the Fuse Holder back into the rear panel and tighten using a screwdriver. Be careful not to overtighten.

Figure 19. Fuse Holders

Figure 20. Remove Fuse Holder

Figure 21. Remove Fuse from Holder

Cleaning the Quartz Optic Plate

Based on the cleanliness of your operating environment, establish a schedule for cleaning the LED array optic plate. When cleaning is required, shut the unit down and allow it to cool. Then clean the quartz optic plate surface (Figure 22) with a clean lint-free cloth and isopropyl alcohol.

Figure 22. Quartz Optic Plate

Belt Tracking Adjustment

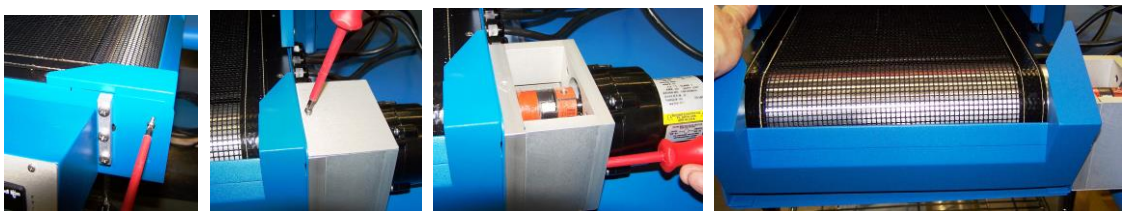
All Dymax UVCS conveyors are factory adjusted to provide proper tracking of the belt. Should further adjustments become necessary, this is done via two knurled adjustment knobs located at the input end of the conveyor. To adjust tracking, simply tighten the side to which the belt is tracking. **DO NOT OVER TIGHTEN THE BELT**, this will lead to accelerated degradation of the belt.

Figure 23. Belt Adjustment

Conveyor Belt Replacement

1. Remove the pinch guard from the motor side of the conveyor by removing the two M4x8 screws on the front side of the conveyor and the M4x25 screw from the motor drive side of the conveyor. Remove the motor box cover to obtain access to the M4x25 screw.

Figure 24. Remove Pinch Guard

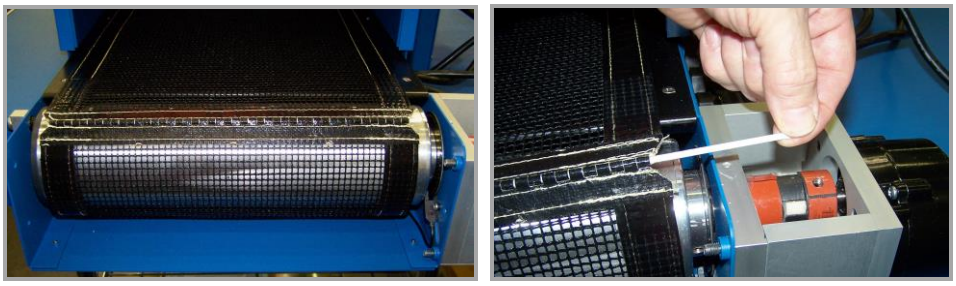


2. Remove all tension from the belt by fully backing off the belt adjustment knobs. (Figure 25)

Figure 25. Remove Tension from Belt

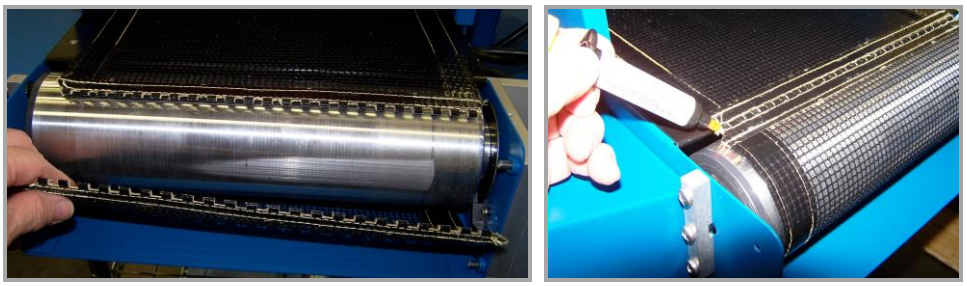
3. Position the belt splice to the end of the conveyor. Remove the fiberglass rod that ties the ends of the belt together. Remove the belt.

Figure 26. Remove Fiberglass Rod



4. Run the new belt around the conveyor frame.
5. Install the fiberglass splice rod through the belt loops.
6. Apply some adhesive to both ends of the fiberglass rod to prevent it from moving during conveyor operation. (Figure 27)

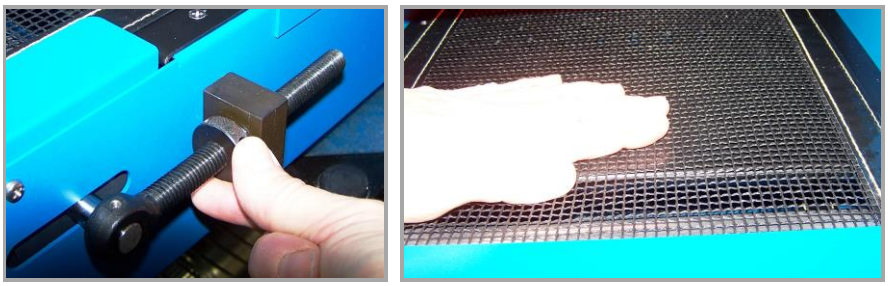
Figure 27. Install Fiberglass Splice Rod and Apply Adhesive



7. Tighten the belt tension knobs finger tight to remove excess slack from the belt. The belt should be loose enough to be moved across the two rollers by hand when the conveyor is not running. (Figure 28)

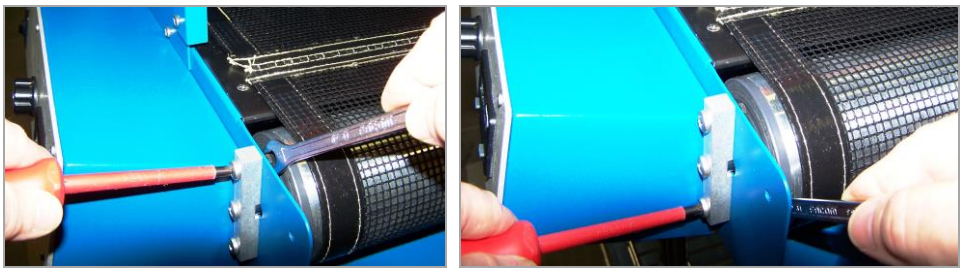
CAUTION! *Excessive tightening of the belt will result in early belt failure. Since the two conveyor rollers have a crown in the middle, only minimum tightening is necessary.*

Figure 28. Tighten Tension Knob and Check Belt Tension



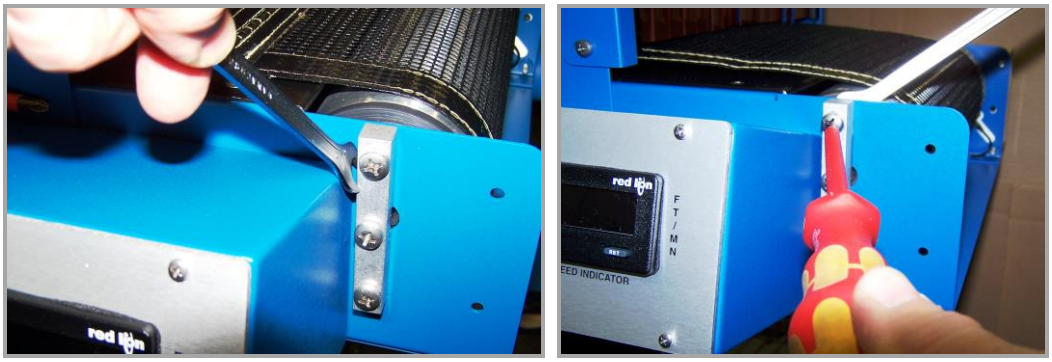
8. Start the conveyor and adjust the belt tensioning knobs until the belt runs in the center of the loading end. The belt should be able to be stopped by hand when the conveyor is running. If stopping the belt stalls the conveyor motor, the belt is too tight and must be loosened.
9. When the belt runs in the center of the loading end, observe belt position at the motor end. If the belt runs to far to one side on the motor end, adjust the motor pulley as follows:
    a. Turn the conveyor off.
    b. Remove belt tension by loosening the two tensioning knobs.
    c. Loosen the two drive roller shaft support fasteners located on the front of the conveyor frame enough to slightly move the shaft assembly.

Figure 29. Loosen Drive Shaft Rollers



d. Move the shaft assembly slightly to realign the drive roller and center the belt. Tighten the bolts when adjustment is complete.

Figure 30. Adjust Shaft Assembly



e. Turn the conveyor on and adjust the belt tension knobs until the belt is properly tightened. Make sure that the belt runs in the center of the conveyor on both the loading and unloading end. Repeat this step as necessary to align the belt.

f. Reinstall the pinch guards on both ends of the conveyor. This step is critical to belt speed sensor operation. The pinch guard on the unloading side of the conveyor contains a shield for the sensor to prevent damage if the belt contacts it while operating.

Figure 31. Reinstall the Pinch Guards

Troubleshooting

The *BlueWave LED Flood System* constantly verifies the performance of the power supply and LED head. If a problem is detected, a diagnostic screen is displayed (Figure 32).

Please take note of the contents of the screen and contact Dymax for support.

If a screen like Figure 33 appears, the LED Head has overheated. The system will attempt to cool the LED Head for approximately 5 minutes. If the head cools down within this time period, the LED Flood system will continue to operate normally. Otherwise, the diagnostic screen (Figure 32) will be shown.

Figure 32. Diagnostics Screen

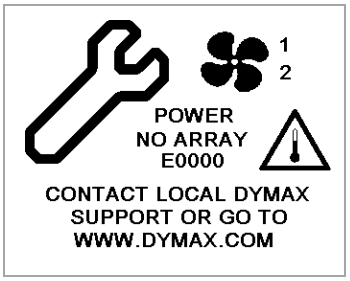


Figure 33. LED Head Has Overheated

Table 1. Troubleshooting Chart for UVCS LED Conveyor Systems – LED Array Issues

Problem	Possible Cause	Corrective Action
Unit does not power up	The Power Cord is not plugged in or damaged	Check the connections and condition of the Power Cord
	The Onboard Fuse is blown	Check Onboard Fuse
	There is no electrical power at the Receptacle	Test the Receptacle for power
Unit powers up but LED is not producing light	The LED intensity adjustment is set to the minimum	Increase the LED intensity setting.
	The Interface Cable connections are loose or damaged	Check the connections and condition of the Interface Cable
	The activation switch on the conveyor is not in the “on” position	Verify that they activation switch is in the “on” position
Unit is operating normally and LED suddenly stops producing light	The over-temperature shutdown was triggered	Check that the flow of cooling air into the Power supply or LED Flood Array is not restricted. Check that the Filter is clean. If the LED does not illuminate after restarting, contact Dymax Application Engineering
LED Array provides only low-intensity light	The LED intensity adjustment is set to the minimum	Increase the LED intensity setting
	The Lens Optics are contaminated/dirty	Clean the surface of the Lens
	Lamp height may have changed since last operated	Verify the lamp height and adjust as needed

Table 2. Troubleshooting Chart for UVCS LED Conveyor Systems – Conveyor Issues

Problem	Possible Cause	Corrective Action
Foot Switch does not function	The Foot Switch is not connected	Connect the Foot Switch.
	The Foot Switch is defective	Activate the unit using the Front Control Panel. Replace the Foot Switch if the unit operates from the Front Control Panel.
Unit appears to run hot	The Cooling Fan Filter is dirty or blocked	Replace the Cooling Fan Filters. Remove items that are blocking the Filter and Air Inlet.
	There is insufficient clearance around the Power supply	Ensure 1" [2.54 cm] of clearance is provided around the Power Supply and at least 6" [15.24 cm] of clearance is provided around the Cooling Fan Inlets.
	The Fan is not operating	Ensure that the Fan is operating. Contact Dymax Application Engineering.
	The power supply is contaminated with dust or debris	Contact Dymax Application Engineering.
Conveyor Not Operating	Main Line Circuit Breaker deployed	Toggle Power Switch off, then on, to reset the Circuit Breaker. Check the amp rating of the Breaker. Compare it to Specifications.
	Improperly fastened connections	Check all connections. Verify that the power cord is Properly fastened.
	Fuses for Motor Controller blown	Remove the Fuses from the Fuse Holders (located in the left side of Control Box) and check with an Ohmmeter, replace if defective.
	Belt is hung up	Inspect the Belt for any signs of a mechanical bind. Tighten the Belt if it is slipping on the Drive Roller.
	Tension too low on Belt (Power Switch lights and Motor turns but Belt does not move)	Use the Tracking Adjustment Knobs to increase the tension on the Belt. Both Knobs will have to be turned the same amount to not affect the alignment.
Belt Tracks to One Side	Belt Adjustment Knobs are out of position	Tighten the Adjustment Knob (located on the side to which the Belt is tracking towards) until the Belt tracks straight. Only minor adjustments should be made at one time.

Spare Parts and Accessories

Spare/Replacement Parts

Item	Part Number
Key System Components	
LED Flood Power supply	41276
PrimeCure™ LED Flood Array – 385 nm Wavelength	41210
VisiCure™ LED Flood Array – 405 nm Wavelength	41211
RediCure™ LED Flood Array – 365 nm Wavelength	41212
Quartz Optic Lens	41331
Air Filter Assembly	41330
Fuses: 12 Amp	41271
AC Power Cords	
Power Cord, North American	41274
Power Cord, China	41275
Conveyor	
Blower, 115 VAC	40146
Blower, 220 VAC	40147
Circuit Breaker, 115 VAC	39128
Curtain Assembly (2 Required)	39207
DC Motor Controller	40179
DC Motor Controller Resistor	40178
DC Motor Speed Indicator Sensor	39136
Gear Motor, 90 VDC	39285
Hour Meter	35981
Mesh Belt	39134
Mesh Belt, Fine	39772
Pinch Guard, Conveyor Discharge	39119
Pinch Guard, Conveyor Inlet	39118
Potentiometer, Conveyor Speed	40006
Potentiometer, Exhaust Blower Speed	40149
Red Lion Counter Timer 50020	39132
Red Lion 12V Power Supply	39133
Shield, Solid Acrylic (2 Required)	39205
Speed Controller Knob	40143

Options/Accessories

Item	Part Number
Personal Protection Equipment	
Protective Goggles — Green	35286
Protective Goggles — Gray (standard model included with unit)	35285
Face Shield	35186
Radiometers	
Power Puck II Radiometer (UVA, UVB, UVC & Visible)	38129
Dymax ACCU-CAL™ 150 (UVA)	40550
Misc.	
Power Supply to Irradiator Head Power Cable, 115" [292.1 cm]	41228
Retro-Fit Kit (For Use with UVCS Conveyors)	41340
Conveyor	
Conveyor Rolling Cart Kit	39215
Riser Kit, 2"	39218
Riser Kit, 6"	39280
Shield Extension Kit	39209
Temperature Strip Indicator Kit	38693

Specifications

Specifications

Property	Specification		
Part Numbers	VisiCure™ 405 nm	**41260**	Power cord NOT included*
		41288	North American power cord with 120V plug
		41291	Asian Power cord
	PrimeCure™ 385 nm	**41261**	Power cord NOT included*
		41287	North American power cord with 120V plug
		41290	Asian Power cord
	RediCure™ 365 nm	**41262**	Power cord NOT included*
		41289	North American power cord with 120V plug
		41292	Asian Power cord
Typical Initial Output Intensities**	VisiCure™: 950 mW/cm^2 PrimeCure™: 850 mW/cm^2 RediCure™: 450 mW/cm^2		
Output Frequency	365 nm, 385 nm, or 405 nm		
Power Requirements	100-240 V, 50-60 Hz (auto ranging)		
Fuse	12 amp		
LED Timer	0.1 to 9999.9 seconds		
LED Activation	Foot switch, front panel, or PLC		
Cooling	Forced air, filtered fan		
Hour Meter	Unit operation and exposure (non-resettable)		
Dimensions (W x D x H)	Power Supply : 13.00" x 18.25" x 4.50" [33.0 cm x 46.4 cm x 11.4 cm] Array: 6.50" x 5.75" x 7.50" [16.5 cm x 14.6 cm x 19.1 cm]		
Interconnect Cable Length	115" [292.1 cm]		
I/O Port	25-Pin D-Sub		
Weight	Power Supply: 15 lbs [6.8 kg] Array: 8 lbs [3.6 kg]		
Unit Warranty	1 year from purchase date		
Operating Environment	20 – 40°C, non-condensing		
Sound Level	68 decibels at 36" [91 cm] distance (at full power)		

* For European customers, the appropriate power cord is added.
** When measured at 1 in [25 mm] distance with an ACCU-CAL™ 50-LED radiometer in flood mode

Figure 34. PrimeCure™ Wavelength

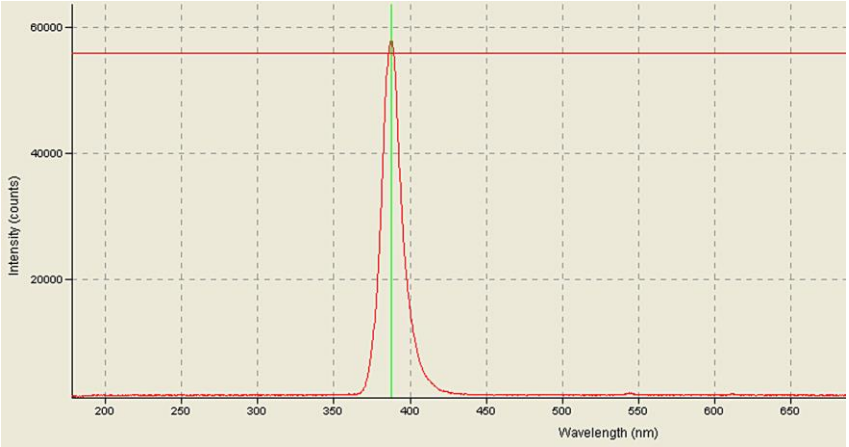


Figure 35. VisiCure™ Wavelength

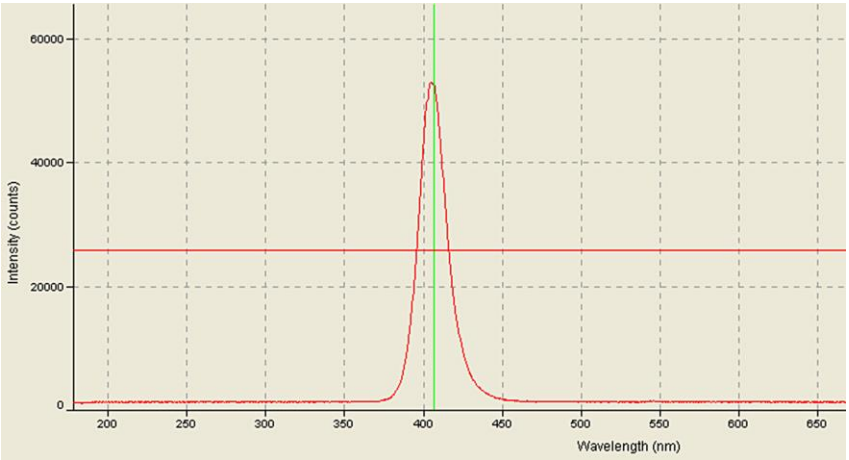
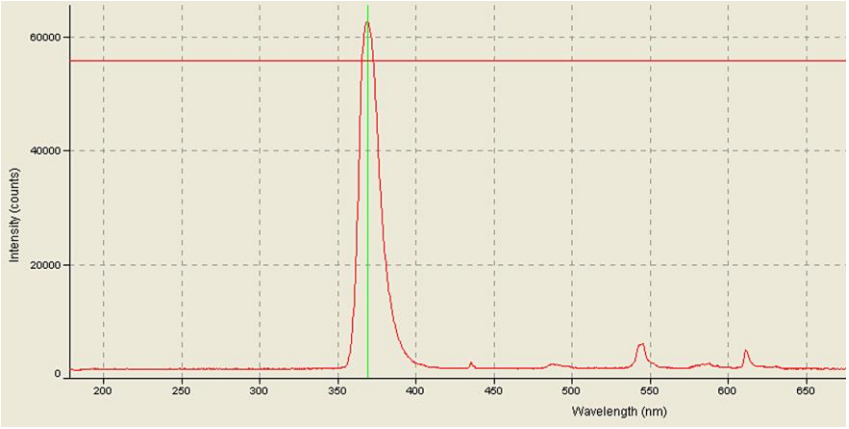


Figure 36. RediCure™ Wavelength



Definition of Terms

Brightness, also known as **Luminance** - Description of energy in the visible region of the spectrum (approximately from 400 to 700 nm) and recorded in photometric units. "**Intensity**" (see below) of visible light energy is called Illuminance.

Dose - irradiance integrated over time, or Irradiance (W/cm^2) x Time (s) = Dose (Joules/cm^2).

NOTE: *Watt is the power that gives rise to the production of energy at the rate of 1-joule (J) per second (s).*

Flood Array System - set of components arranged to generate, collect, condition and direct UV radiant energy to perform curing of engineering adhesives, coatings, and inks within a safe and controlled process. It includes an array housing and power supply and may also include a shutter, workstation, UV enclosure, Dymax light shield, and/or accessories.

Illuminance - Luminous flux (energy of visible light) incident per unit area, and measured in **Lx** (lux) or **Lumen/cm^2**.

Intensity - a measure of light energy over the unit of surface area (usually the surface at the specified working distance from the bottom of the reflector housing) in W/cm^2 or mW/cm^2.

Array – LED light source generating ultraviolet, visible, and infrared radiant energy from burning matter stimulated by electrical power conditioned by a proper power supply.

Ozone - oxidizing agent (O^3) produced by the action of ultraviolet radiant energy (below 185 nm) or electrical corona discharge of oxygen on air.

Ultraviolet (UV) - The invisible region of the spectrum just beyond the violet end of the visible region. Wavelength ranges in general from 1.0 to 400 nm. Dymax Arrays do not radiate energy in deep ultraviolet; there are very minute amounts below 220 nm and practically nothing can be sensed below 200 nm. This is due to the use of ozone-blocking quartz bulb envelope (See Ozone).

Ultraviolet is used beneficially in various fields of industry and medicine. In order to standardize light sources used in medicine, the International Congress on Light, in Copenhagen in 1932, recommended dividing the ultraviolet spectrum into three spectral parts:

- **Ultraviolet A** (UV-A) - UV of long wavelength from within approximately 400 to 320 nm of the spectral band (4000 to 3200⊕) - predominately produced by Dymax flood arrays.
- **Ultraviolet B** (UV-B) - UV of medium wavelength from within approximately 320 to 280 nm - Dymax LED flood arrays produce some amount of their energy within this bandwidth.
- **Ultraviolet C** (UV-C) - UV of short wavelength below 280 nm (we say from 280 to 200 nm) – a large amount of this energy is present in the sunlight.

OSHA 1910.145: "Regulation of Accident prevention Signs and Tags" defines the following headers as:

- **WARNING** – is used when there is a hazardous situation that has some probability of severe injury.
- **CAUTION** - is used to indicate a hazardous situation that may result in minor or moderate injury.
- **NOTICE** - is used to convey a message related directly or indirectly to the safety of personnel, or protection of property.

Warranty

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components (excluding LED array) with proof of purchase and purchase date. Unauthorized repair, modification, or improper use of equipment may void your warranty benefits. The use of aftermarket replacement parts not supplied or approved by Dymax Corporation will void any effective warranties and may result in damage to the equipment.

IMPORTANT NOTE: *DYMAX CORPORATION RESERVES THE RIGHT TO INVALIDATE ANY WARRANTIES, EXPRESSED OR IMPLIED, DUE TO ANY REPAIRS PERFORMED OR ATTEMPTED ON DYMAX EQUIPMENT WITHOUT WRITTEN AUTHORIZATION FROM DYMAX. THOSE CORRECTIVE ACTIONS LISTED ABOVE ARE LIMITED TO THIS AUTHORIZATION.*

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Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application and use is strictly limited to that contained in Dymax's standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to insure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation by offering equipment trial rental and leasing programs to assist in such testing and evaluations. Data sheets are available for valve controllers or pressure pots upon request.

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